

Deciphering the role of cryptocurrencies in global remittances: a comprehensive literature review

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Abstract

Purpose – In the evolving landscape of global remittances, this study systematically explores cryptocurrency's transformative impact on remittance services through a comprehensive literature review and bibliometric analysis.

Design/methodology/approach – Through meticulous PRISMA-guided analysis, the research identifies cryptocurrency technology as a pivotal force in enhancing remittance efficiency, reducing costs and broadening access contributing significantly to financial inclusion.

Findings – Findings revealed that cryptocurrency technology could significantly enhance remittance services, offering improved efficiency, reduced costs and increased accessibility. This suggests a transformative potential for financial inclusion, presenting a compelling case for broader adoption and regulatory support to leverage these benefits effectively.

Research limitations/implications – By integrating recent research, this work underlines the urgent need for broader adoption and regulatory support to leverage these benefits effectively. It offers novel insights for institutions and policymakers, highlighting the potential for technology adoption in remittances to enhance financial inclusivity.

Originality/value – More cryptocurrency studies are needed to concentrate on remittance markets. Thus, this investigation constitutes a unique addition to the field. Additional investigation in this domain presents significant possibilities for future exploration and progress.

Keywords Cryptocurrencies, Blockchain, Remittances, Innovation, Financial inclusion

Paper type Literature review

1. Introduction

Financial inclusion provides economic infrastructure for money movement (Fahmy and Ghoneim, 2023; Marcelin *et al.*, 2021). Remittances and money transfers between nations are supplied mainly by banks and financial institutions (Emara and Mohieldin, 2020). These transfers often incur charges due to exchange rate variations (Chuc *et al.*, 2021). UN's 2030 sustainable development goals (SDGs) include reducing remittance costs (SDG 10), as high costs push migrants towards informal channels (Hudaefi, 2020). The prevalence of fraud in financial transactions significantly undermines financial inclusion, highlighting the need for stringent security measures and regulatory frameworks. This issue exacerbates the challenges of high remittance costs, directly contravening the UN's 2030 SDGs to enhance economic accessibility. Asmah and Atuilik (2023) underscore the urgency of addressing these concerns to facilitate safer, more inclusive financial ecosystems.

Despite accounting for a small portion of international business transfers, remittance fees can be exorbitant, benefiting high-quality services over those for migratory workers (Ratha and Riedberg, 2005; Solimano, 2003). Poor migrants may opt for unofficial channels like the hawala system or transport companies (Ahmed *et al.*, 2021).

Remittances significantly aid low- and middle-income countries (LMICs), exceeding many countries' foreign direct investment and government aid ("World Development Report, 2021: Data for Better Lives," 2021). In 2020, LMICs received 540 billion USD in remittances, an



increase from 2010. However, unofficial remittances suggest underestimation (Freund and Spatafora, 2008).

Given remittances' inelasticity of the worker's demand, interest grows in reducing costs for financial inclusion (Alsamara, 2022; Kakhkharov *et al.*, 2017). Simultaneously, global cryptocurrency adoption escalates (Kim *et al.*, 2022), promising potential for remittance applications. Emerging markets lead in this space, particularly in lower- and upper-income nations (Chainalysis, 2022). However, Kim *et al.* (2022) highlighted that blockchain and cryptocurrency utilisation in these countries still needs to grow, with most consumers preferring traditional banking services (Martins *et al.*, 2014).

Despite the growing interest in blockchain and cryptocurrencies, particularly in remittances, the field needs a systematic literature review and bibliometric analysis. This gap highlights the need for comprehensive research to understand the dynamics of cryptocurrency in remittance services and its potential to revolutionise financial transactions.

This research contributes to the existing literature on cryptocurrencies: focus on remittances, a comprehensive literature overview using bibliometric tools and identifying solutions to blockchain and cryptocurrency disadvantages. While previous works explored blockchain in finance, remittance services were largely overlooked (Mafike and Mawela, 2022). This research, however, emphasises remittance systems, identifying key challenges and potential resolutions. Incorporating recent research, this study underlines cryptocurrency's pivotal role in enhancing remittance efficiency, cutting costs and broadening access, contributing to the discourse on financial inclusion and technological integration.

This study will carefully review and organise the present body of research literature that has either quantitatively or qualitatively examined cryptocurrency technology in remittance services. With a thorough examination of the literature, this research emphasises the application of cryptocurrencies in remittance services, including banking, insurance, trade finance and other financial services offered in a financial system. The goal is to investigate how much technology has been used and what advantages have been gained in the remittance services industry. The following research questions assisted with the systematic literature review:

- RQ1. What is "cryptocurrency technology" meant in the context of remittance services?
- RQ2. What is the approach used to analyse the technology?
- RQ3. What outcomes does a remittance system using cryptocurrency technology achieve?

Following is the organisation of the study: The first section briefly introduces cryptocurrencies in remittance services. Section 2 describes the study's aims and research methods. Section 3 describes the literature review and bibliometric analysis of the research. Section 4 focuses on cryptocurrency's hurdles to widespread adoption in remittances. Section 5 analyses and explains the research study's findings. Section 6 finishes the investigation.

2. Methodology

Recent studies have analysed financial services, blockchain and cryptocurrencies to see what hinders their uptake and use (Sanka and Cheung, 2021). We first summarised the relevant literature before diving into it. We searched numerous databases for relevant literature published between 2012 and 2023 and then used the Biblioshiny Web tool combined with the VOSViewer v. 6.19 tool to tabulate and analyse the findings. To ensure the reliability of our analysis amidst potential code definition issues, all authors collaborated closely to verify code analysis results. This collective approach, reflecting best practices in research integrity and

methodology (as suggested in relevant literature), enhanced the accuracy and trustworthiness of our findings, ensuring rigorous scrutiny and validation of our analytical processes (Massaro *et al.*, 2016).

The research must fill a necessity to incorporate all cryptocurrency and blockchain frameworks in the remittance sector. A research need is discovered by focusing on the literature stream that examines how cryptocurrency capabilities improve remittances.

This research employed a systematic literature review following Petticrew & Roberts’ “Systematic evaluations may offer solid, trustworthy summaries of the most dependable evidence” approach (Petticrew and Roberts, 2008). Harris *et al.* (2019) further note that systematic review helps researchers to organise and duplicate their studies (Harris *et al.*, 2019). SLR data allowed bibliometric, content and network analysis. Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) criteria (Page *et al.*, 2021) were used to perform a complete systematic review. PRISMA requires databases, selection method, search technique, search date, and inclusion and exclusion criteria. Bitcoin, remittances, blockchain, title, abstract, keywords and subject were searched in five databases using the advanced search in January 2024. Non-peer-reviewed and non-English papers are excluded. The authors searched SCOPUS, Google Scholar (GS), EBSCO Discovery and Proquest for business articles (Martín-Martín *et al.*, 2018). Figure 1 shows PRISMA-filtered search results. Two writers independently evaluated and discussed articles.

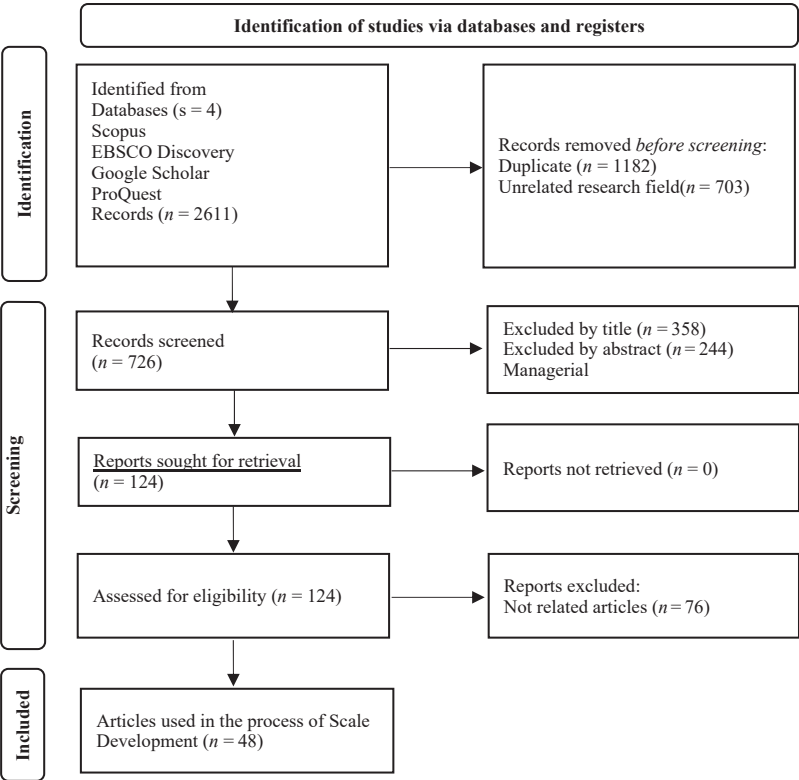


Figure 1.
Prisma flow diagram

Source(s): Authors’ elaboration from page *et al.* (2021)

Example of search used in Scopus TITLE-ABS-KEY ((Cryptocurrency AND Remittances) OR (Remittances AND "Blockchain Technology") OR (Blockchain AND Remittances) OR (Remittances AND "Cryptocurrency Technology") OR ("Blockchain Technology" AND Remittance) AND (LIMIT-TO (DOCTYPE, "ar") OR LIMIT-TO (DOCTYPE, "j"))).

After a based article analysis, keyword co-occurrences were examined (Tranfield *et al.*, 2003). Keywords and sub-questions were chosen for analysis based on both techniques. We meticulously developed search terms encompassing many study issue terminologies to enhance our methodological approach. Primary and supplemental terms were meticulously selected for a thorough literature review. We utilised names such as "Cryptocurrency", "Blockchain" and "Remittance", together with their associated terminology, to symbolise the intricate global discussions on remittances involving cryptocurrencies.

The authors' literature search databases were EBSCO Discover, SCOPUS and Google Scholar. "AND" and "OR" were employed to aggregate keywords into strings for the database topic search. Wildcard searches yielded the correct number of hits for specific phrases.

The systematic literature review employed keyword mapping to seek bibliographic data. A thorough literature research was planned to help evaluate keyword links and identify knowledge gaps. Table 1 shows peer-reviewed publications in selected databases by the search string.

Table 2 lists the most relevant papers from EBSCO, Elsevier's abstract and citation database (SCOPUS) and Google Scholar with the keywords "cryptocurrency", "blockchain" and "remittances" from 2016 to 2023. Author(s), year of publication, country of reference, the technique used with theoretical background and article title were collected from research publications and placed into a spreadsheet. The research articles were reviewed based on the study's theories, methods, context and significance with the remittance service and cryptocurrency technology.

3. Literature review and bibliometric analysis

In this pivotal section, we investigate an extensive literature review and a detailed bibliometric analysis, aiming to elucidate the multifaceted role of cryptocurrency in remittance services. This segment synthesises a broad spectrum of quantitative and qualitative research, highlighting key advancements and discerning patterns in the application of cryptocurrencies within the financial sector, specifically focusing on remittances. We employ advanced bibliometric tools to systematically map and analyse

Search string	EBSCO	SCOPUS	ProQuest	Google Scholar
'Cryptocurrency' + 'Remittance'	1	16	313	245
'Cryptocurrency' + 'Remittances'	1	16	335	354
'Cryptocurrencies' + 'Remittance'	1	20	278	382
'Stable coins' + 'Remittances'	1	1	362	14
'Digital currency' + 'Remittance'	1	12	867	237
'Cryptocurrency' + 'Cross-border'	1	25	679	889
'Blockchain' + 'Remittance'	2	45	457	618
'Blockchain' + 'Remittances'	2	45	457	461
'Blockchain technology' + 'Remittances'	4	27	454	453
'Blockchain' + 'Cross-border'	47	214	1738	1,690
'Distributed Ledger' + 'Remittances'	3	15	289	328
'Blockchain technology' + 'Cross-border'	41	162	1717	1,020
'Bitcoin' + 'Remittances'	4	22	374	151

Source(s): Authors' elaboration

Table 1.
The number of articles
discovered by applying
search strings to the
corresponding online
database

Authors	Method	Findings	Road forward
Jana and Sahu (2023b)	Quantitative	The data confirm that cryptocurrencies are uncorrelated with the Indian stock market in a strong economy	This article employs the wavelet approach to analyse market dynamics and investor strategies in different economic scenarios to examine cryptocurrencies' dual role as diversified assets and safe havens in the Indian stock market. Subsequent research could utilise minute and hourly data to examine the impact of digital currencies on the stock market.
Jana and Sahu (2023a)	Quantitative	Before the crisis, there was a negative relationship between stocks and cryptocurrencies, which turned positive during the crisis except for Tether.	
Jegerson <i>et al.</i> (2023a)	Quantitative	Consumer innovation mediates perceived risk and behavioural intention, enhancing cryptocurrency use for remittances in the UAE.	This paper highlights the importance of consumer innovation in mediating the relationship between perceived risks and the behavioural intention to use cryptocurrencies for remittances in the UAE, providing valuable insights for remittance market cryptocurrency adoption strategies.
Jegerson <i>et al.</i> (2023b)	Quantitative	This study finds that performance expectations, price value, hedonic motivation and consumer innovativeness predict UAE cryptocurrency adoption intent, highlighting the importance of facilitating conditions in actual usage despite behavioural intentions not reliably predicting consumption.	This study shows that performance expectations, pricing value, hedonic motivation, and consumer innovativeness affect Bitcoin adoption intent in the UAE. It also highlights enabling environments as key for cryptocurrency use, providing insights for adoption tactics.
Mafike and Mawela (2022)	Literature review	This study underscores key facets of blockchain banking: platform selection, scalability, robustness and governance collaboration.	The literature identifies technological, organisational and environmental obstacles limiting blockchain adoption in finance.
Davelis <i>et al.</i> (2022)	Chapter	History of blockchain and its key components, continuing to describe blockchain technology and smart contracts.	The study recommends preparing, designing, planning, implementing and reviewing blockchain in modern company.
Gupta and Kanungo (2022)	Quantitative	Digitalization of formal financial intermediaries like banks is anticipated to increase financial inclusion for the BOP (Bottom of the Pyramid).	This study propels research on social inclusion, microfinancing and underprivileged groups' empowerment.
Arias-Oliva <i>et al.</i> (2021)	Quantitative	Perceived expectation, effort expectancy and facilitation circumstances are the most important factors in cryptocurrency adoption.	Future research should explore blockchain mining sustainability and varied economic actors.

Table 2.
List of relevant articles
used in the literature
review

(continued)

Authors	Method	Findings	Road forward
Alqaryouti <i>et al.</i> (2020)	Qualitative	Participants generally comprehend cryptocurrency, perceive its benefits, and drawbacks, and express intentions for future use	Future research should investigate individual cryptocurrency acceptance or rejection, considering privacy and security risks in its mainstream adoption
Anser <i>et al.</i> (2020)	Quantitative	Social media usage enhances Bitcoin adoption intentions, moderated by perceived risk, through attitudinal, normative and control perceptions	This study provides a foundation for future research on cryptocurrency adoption predictions, psychological mechanisms, and border constraints
Gil-Cordero <i>et al.</i> (2020)	Quantitative	The findings demonstrate that all components have a direct or indirect impact on cryptocurrency usage intentions	It would be interesting to research how volatility, simplicity of usage and enabling circumstances effect cryptocurrency
Yoo <i>et al.</i> (2020)	Quantitative	Advantages, service compatibility, risk, cost and complexity influenced behavioural intent but not user adoption. Service trialability and observability were poor user uptake antecedents	Future research should address restrictions and provide more information about Bitcoin transaction services user behaviour
Kulkarni <i>et al.</i> (2020)	Quantitative	Cryptocurrencies and blockchains, accessible via increasing mobile penetration, could revolutionize transactions by eliminating untrusted intermediaries, including for the "unbanked"	A globally-backed stablecoin could enhance remittances, international trade, and inclusive economy by reducing transaction fees
Almuraqab (2020)	Quantitative	Perceived benefit, trust, social influence and simplicity moderate awareness-use relationship, differing between UAE and global digital currency adoption	Future research could elucidate sociocultural factors and unexplored correlations impacting acceptance
Hashemi Joo <i>et al.</i> (2020)	Quantitative	Cryptocurrency is the first successful application of blockchain technology and can be used as the main fuel of the global money transfer network	A partial least squares-structural equation modelling (PLS-SEM) neural network approach for understanding cryptocurrency adoption
Soufaih (2020)	Quantitative	The examination of the remittance sector and its competitive landscape suggests that blockchain will disrupt and entirely transform the space in the next years	This study discusses blockchain's remittance benefits, including lower prices, faster transfers and the ability to serve the unbanked
Huang (2019)	Quantitative	Perceived risks influence expectation of government engagement; demographic factors should be considered for effective Bitcoin regulation	Future research should expand geographically and temporally, prioritizing data quality, validity and understanding investor motivations

(continued)

Table 2.

Authors	Method	Findings	Road forward
Hwang and Moon (2019)	Quantitative	Cryptocurrency users care about security and danger	The study proposes three security solutions for Bitcoin exchange marketplaces to ensure secure transactions
Qiu et al. (2019)	SWOT	Ripple outperforms SWIFT but has several drawbacks	Ripple will ultimately change the remittance sector and other financial institutions
Mendoza-Tello et al. (2019)	Quantitative	Perceived utility, not trust, risk or ease of use, primarily influences cryptocurrency adoption	Examine cryptocurrency's societal impacts and challenge innovation theory with expanded user awareness
Roussou et al. (2019)	Quantitative	This research highlights the importance of perceived security and usefulness for digital currencies' business adoption	Managers must believe digital currencies are consistent with present beliefs and practices to use them
Sobhanifard and Sadatfarizani (2019)	Mix	Technical skills, uncertainties and benefits enhance Bitcoin usage, aiding various stakeholders in developing nations	This research assesses cryptocurrency consumption characteristics from consumers' perspectives

Table 2. Source(s): Authors' own elaboration

the academic terrain, uncovering the frequency, relationships, and impact of pivotal terms and themes. This approach provides a comprehensive overview of the existing body of knowledge and identifies gaps and emerging trends, setting the stage for future research directions in this rapidly evolving field.

3.1 Remittances

Considerable theoretical and empirical research from the early 1990s demonstrates a causal relationship between financial growth, enhanced company performance and increasing economic production. Financial development results in improved resource allocation, risk management and a significant proportion of innovative and productivity-enhancing investment ventures. In the extant research, the effects of financial deepening, or the quantity of credit accessible to the private sector, have attracted the most attention ([Aracil et al., 2021](#); [Chauvet and Jacolin, 2017](#); [Feghali et al., 2021](#)). These studies indicate that remittances positively impact financial depth, but they reveal nothing about their impact on financial inclusion. If a large number of tax credits are granted to a small number of households, financial depth may increase while financial inclusion decreases. Even if it is true that more significant remittance inflows improve financial depth at the national or local level, this only sometimes translates into greater financial inclusion for those who receive them. Expressly, poorer remittance recipient families may be excluded from the financial system if the growth in credit at the macro level due to growing remittance flows is directed to non-remittance recipient households. Even if remittance receivers do not create accounts, the remittances they send home will probably be transferred into the accounts of non-remittance recipients ([Anzoategui et al., 2014](#)).

People who utilise cash or non-digital modes of payment in the physical, cash-based or informal economy provide an untapped yet substantial market for enhanced services. There is substantial untapped potential for economic development and business profit in providing financial services to the more than two billion people who are now excluded from the global financial system ([Marcelin et al., 2021](#)). Innovative banking services for underprivileged

individuals are essential for combating poverty and growing economies (Norta *et al.*, 2019). In addition, 250 million migrant workers, tourists, permanent travellers, expatriates, digital nomads and international students are underbanked when working and travelling internationally (Christiaensen *et al.*, 2019). Those with a local credit history or bank account may find getting credit and transferring money difficult. Additionally, it is hard to develop a stable credit history while depending on unverifiable cash flow (Chauvet and Jacolin, 2017).

Taking a broader geographical perspective and keeping in mind that emerging countries are the focus of this inquiry, we discovered that the Middle East comprises a varied set of nations with vastly differing degrees of economic and political development and a history of historically sluggish adoption of integration. Several emerging countries have a history of colonial oppression, ongoing hostilities, tribal and religious rivalries, and substantial economic disparities (Martin, 2022).

Thus, while remittances significantly impact financial systems, particularly in LMICs, the traditional mechanisms are marred by inefficiencies and high costs. This sets the stage for introducing blockchain technology, offering a ground-breaking shift toward more efficient, secure and cost-effective remittance processes, fundamentally altering the financial landscape.

3.2 Blockchain

The preceding sections show that financial inclusion varies greatly throughout emerging countries, primarily due to country differences (Kim *et al.*, 2022). Recent technical developments in these regions provide the path for increased countries' cohesion and development. Blockchain is one such innovation; it is an immutable distributed ledger that eliminates the need for intermediaries and fundamentally alters how online transactions are done. Blockchain was first intended to support Bitcoin and other cryptocurrencies, but it has now found extensive usage in other industries where safe and reliable data recording is necessary. Since its debut, blockchain technologies have shown promise in areas such as the formalisation of remittances and expanding access to formal financial services (Garg *et al.*, 2021). Regulators and practitioners have recently studied blockchain technology's potential to modernise and replace international money transfer infrastructure (Rodima-Taylor and Grimes, 2017).

Blockchain technology is the primary architect of cryptocurrency's success. A distributed digital ledger records transactions between two parties chronologically, transparently, competently, verifiably and permanently using blockchain technology (Reid and Harrigan, 2013). A ledger's security is maintained by miners who control the ledger. The primary distinction between blockchain and other systems is blockchain's decentralised, instance-less nature. A network of connecting nodes forms the blockchain's architecture. Before the invention of blockchain, a central authority that regulated and had access to the whole system was necessary to create a secure transactional framework involving numerous successful parties.

A blockchain is a distributed database that is accessible to all network users. Constantly, new records are added to the network; these records are known as blocks. These blocks' timestamps are connected to the prior block's timestamp, similar to a chain. Adding blocks to the chain is known as mining, and the system creates a token allocated to the node via a process of reformulating the node. Because it is a unit that can be traded like cash, the produced token is known as cryptocurrency (Morkunas *et al.*, 2019). The blockchain employs encryption to prevent tampering with the global ledger. While all users can access the public ledger, only those with the appropriate cryptographic keys may contribute new entries. In addition, other network users can verify the new entry and decide whether it should be

included in the general ledger. This method makes it almost hard to alter or forge archive data. Each block contains data from prior blocks; hence, it is almost challenging to alter transactions recorded in a block (Morkunas *et al.*, 2019).

Integrating blockchain technology in remittances heralds a transformative shift, offering enhanced security and efficiency. This leads us seamlessly into cryptocurrencies, a by-product of blockchain innovation, poised to revolutionise how remittances are processed by enabling faster, more secure, and cost-effective cross-border transactions.

3.3 Cryptocurrency

Cryptocurrency, a technology and technology-enabled service, expedites secure, borderless, decentralised and anonymous Internet transactions using cryptographically signed digital tokens that are publicly traceable (Kulkarni *et al.*, 2020). Unlike most currencies, cryptocurrencies are not supported by a central bank or physical commodity (Albayati *et al.*, 2020; Bjerg, 2016; Hashemi Joo *et al.*, 2020). Satoshi Nakamoto introduced the concept in the seminal work Bitcoin: A Peer-to-Peer Electronic Cash System (Nakamoto, 2008). Nakamoto, who remains unidentified, proposed a “trustless” currency negating the necessity for a third-party mediator for transactional integrity. Various global exchanges facilitate the exchange of Bitcoin and other cryptocurrencies for fiat currency. Nakamoto (2008) proposed Bitcoin to address high transaction costs related to trust and double-spending in online transactions. Neutral entities were required to oversee and resolve conflicts within electronic payment systems, necessitating the implementation of laws ensuring all payments were final. These costs linked to mediation, insurance and fraud detection dictated a minimum viable transaction cost. The transition from physical to digital money created a double-spending problem due to the replicability of digital assets. Nakamoto (2008) designed a system using a network of interconnected computers to maintain a centralised, timestamped public ledger of all transactions and a sequence of anonymous transactions to record ownership. Bitcoin, a “trustless” peer-to-peer transaction system, operates on a digital ledger that records transactions and balances (Shin and Rice, 2022). This ledger is maintained and updated by all nodes in the Bitcoin network, employing algorithms to select the most accurate version in case of duplicates.

Cryptocurrency networks use blockchain technology, enabling secure and transparent transactions without financial intermediaries. Every participant on the network has a cryptocurrency wallet with a key pair consisting of a public key (similar to an email address or bank account number) and a private key (allowing the user to send cryptocurrencies). The private key signifies when cryptocurrency owners move a quantity of cryptocurrency to another user’s wallet.

Gil-Cordero *et al.* (2020) identified four business sectors in the cryptocurrency industry: exchanges, wallets, payments and mining. Users exchange fiat currency for digital coins through cryptocurrency exchanges and store access to their cryptocurrency (the private key) in wallets. These wallets can be hosted online or offline and serve as digital safes for the user’s cryptocurrency. They also noted four use cases: medium of exchange, non-monetary use cases, speculative digital asset/investment and payment rail for cross-border transactions. Cryptocurrency’s lack of universally agreed-upon taxonomy and overlapping terminology exacerbate consumer confusion (Schuh and Shy, 2016).

Cryptocurrencies offer alternative mechanisms for transferring value via a trustless network, influencing individuals, businesses and regulators (Morkunas *et al.*, 2019). Cryptocurrencies facilitate swift, efficient and cost-effective transfers and provide a new payment method for e-commerce merchants. Moreover, it allows firms to receive international payments swiftly, at favourable exchange rates, and with reduced transaction costs.

Research highlighting factors influencing cryptocurrency adoption is increasingly relevant (Elbahrawy *et al.*, 2017). However, research consistency regarding cryptocurrency

introduction needs improvement (Alzahrani and Daim, 2019). Various studies have employed differing hypotheses to investigate cryptocurrency adoption. While some research focuses on adoption decisions, others investigate the influence of trust, safety, and perceived risk on adoption. A comprehensive understanding of factors influencing cryptocurrency adoption necessitates a collective analysis of these research works. More recent research around factors adoption (Jegerson *et al.*, 2023a, 2023b) found that performance expectations, price value, hedonic motivation and consumer innovativeness are significant predictors of cryptocurrency adoption intention.

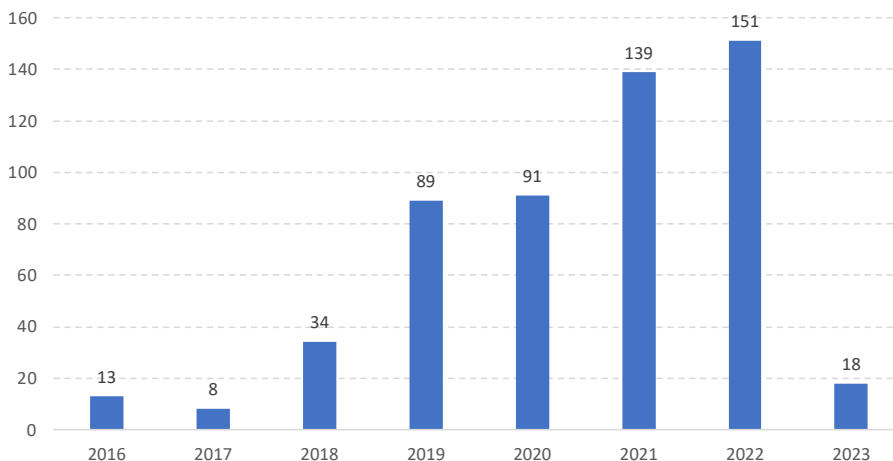
Cryptocurrencies emerged as a vital intersection of remittances and blockchain, offering unprecedented opportunities for seamless, secure cross-border transactions. This intricate relationship necessitates a more profound, quantifiable understanding, leading us to the subsequent section on bibliometric analysis, which will provide empirical insights into the evolving dynamics of these interlinked domains.

3.4 Bibliometric analysis

To undertake additional bibliometric analysis, the distribution of papers by year, citation count and country is shown next.

The bibliography analysis demonstrates that blockchain technology has just appeared and has been attracting the attention of academics since 2016. Since 2016, there has been an increased trend in the number of publications, and this is expected to continue in the following years, given its great potential in all financial services sectors. In addition, Figure 2 illustrates the number of citations in this subject by year.

Figure 2 represents the graph from the biblioshiny analysis depicting the annual distribution and impact of research publications over time based on citation metrics. From the graph, we see an initial high citation average in 2016 that drops sharply in subsequent years before a significant increase, peaking around 2022. This pattern could suggest that articles from 2016 were highly influential when first published. The peak in 2022 indicates the level of interest and critical development in the field, with the decline due to limited paper extraction in early 2023. This data is essential for understanding research trends, the evolution of the field, and identifying the most impactful periods of literature on the subject.



Source(s): Authors' elaboration

Figure 2.
Year-wise average
count of citations

Given its potential advantages to society as a whole, this area of study will draw increasing contributions from scholars throughout the globe. The periodicals that publish papers on blockchain technology in financial services are shown in Table 3, which lists the number of publications by nation to comprehend the contribution of researchers from diverse regions of the globe. The articles in this expanding area of inquiry are shown in Table 3. China (804) has the most significant number of publications, accounting for around 37% of the global publications on blockchain and financial services, followed by the United States (344) and India (248), which may be mainly attributable to the financial inclusion programmes undertaken by the nation's government in recent years and the Digital India project, the United Kingdom (190) and South Korea (127). The table indicates that researchers from rising economies such as India, China and South Korea and industrialised nations from Europe and North America have significantly contributed to this topic. The contributions from many regions of the globe have been substantial; nevertheless, the contributions from Oceania and the Middle East are negligible.

Most published work may be found in engineering, information systems, research and technology journals as shown in Table 4. In addition, business, finance and economics publications covered the research associated with this study. This indicates that block technology and its applications in financial services constitute a diverse field of study. Additionally, the number of publications in each journal is restricted to a maximum of four. This indicates a need for more publications that widely address the study of blockchain technology and its applications in accounting and auditing, banking and insurance, financial markets and financial inclusion.

Table 3.
Top 10 Country-wise
publications

Country	No. of publications
China	804
USA	344
India	248
United Kingdom	190
Korea	127
Italy	116
Spain	115
Germany	89
Australia	81
Japan	80

Source(s): Authors' elaboration

Table 4.
Top 5 journals per no.
of publications

List of source title	No. of publications
<i>Communications in Computer and Information Science</i>	12
<i>Mobile Information Systems</i>	12
<i>Wireless Communications and Mobile Computing</i>	8
<i>Advances in Intelligent Systems and Computing</i>	7
<i>Cluster Computing</i>	7
<i>KSII Transactions on Internet and Information Systems</i>	7
<i>International Journal of Intellectual Property Management</i>	6
<i>New Economic Windows</i>	6
Total	543

Source(s): Authors' elaboration

3.5 Keyword graphical mapping

Reading and manually encoding articles may be time-consuming and susceptible to human error and bias. The authors then used VOSviewer, version 1.6.19, to visualise the strength of study topic word associations by displaying the subject clusters (van Eck and Waltman, 2017). The authors used the default settings of VOSviewer to load bibliographic files. However, academic writing is difficult due to domain-specific jargon, complexity and preferred idioms and writing styles of writers. Balanced between sensitivity and precision, the author gave appropriate subject phrases to aid the programme in completing the assignment. Specificity entails rejecting outside elements, while sensitivity requires detecting as many relevant ones as possible.

Because computers may repeat calculations, the authors opted for specificity to ensure the validity of their conclusions. The authors studied synonyms, plural forms, British spellings and exclusions to ensure the best coverage.

VOSviewer began by extracting co-references from 512 articles. Regarding term clustering, the authors deemed the specified 5-occurrence threshold subjective. The program recommended a 5-occurrence threshold as the default elaborated value, with a maximum of 30. The authors used 5, 10 and 25 instances of VOSviewer to generate a more informative map. When the threshold was set to 5, the analysis returned 1,718 keywords in six clusters, which were difficult to comprehend. At ten, 75 keywords were organised into six groups. At the age of 25, there were 18 keywords organised into three clusters. The final threshold was thirteen occurrences, resulting in the grouping of 48 items into four clusters. The top 48 most often used terms were either generic (e.g. “index”, “Internet”, “risk”) or method-related (e.g. “SEM”, “Structural Equation Modelling”, “panel”, ‘determinants’). Next, “Internet” and “cell” were eliminated as article selection criteria, and their frequency was made generic.

Figure 3 shows the cluster network analysis for all the subject words. Figures 4 and 5 show the keyword maps with the overlay and density visualisation of the chosen databases' bibliographies.

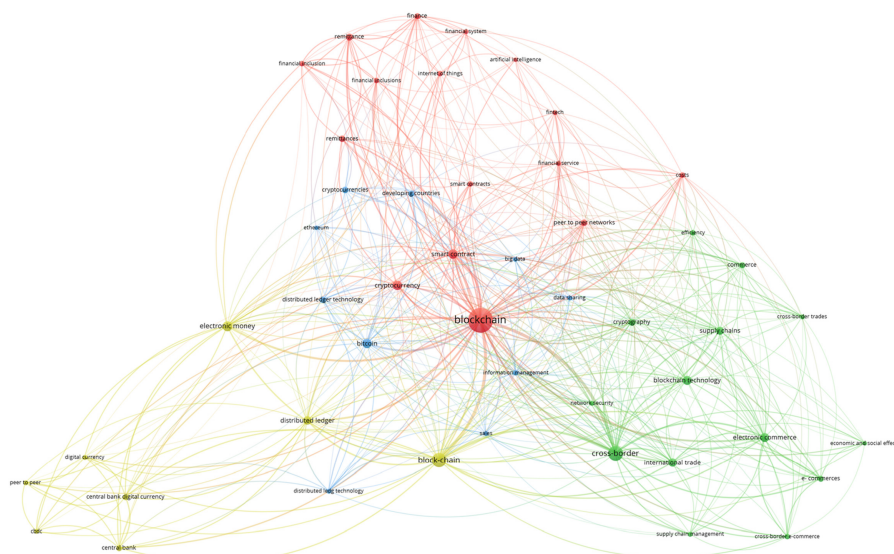
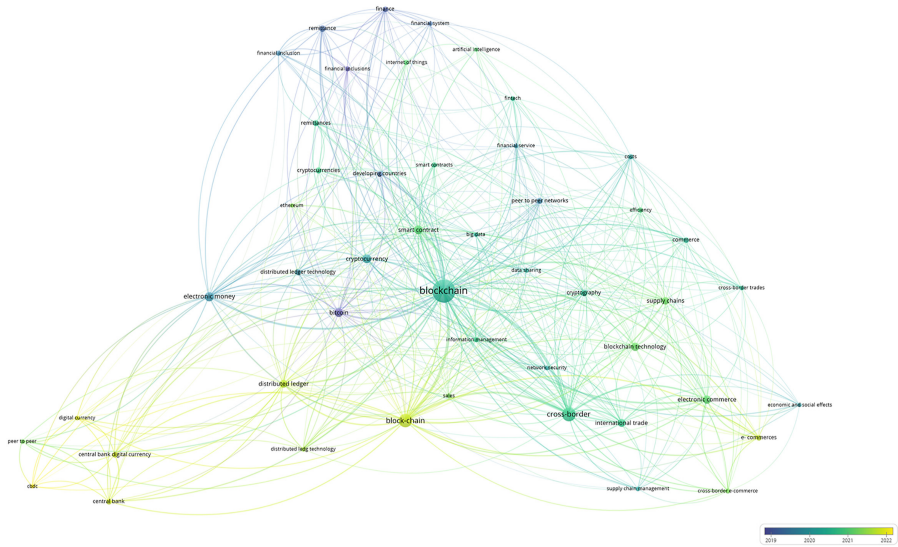
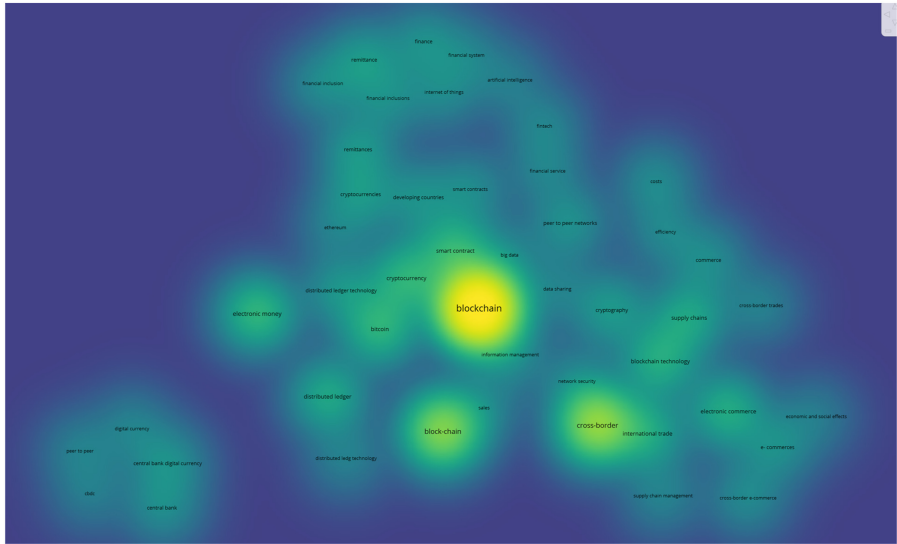


Figure 3.
Map of the keyword
co-occurrence analysis
with a default cut-off
value of 13

Source(s): Authors' own elaboration



Source(s): Authors' own elaboration



Source(s): Authors' own elaboration

4. Descriptive analysis and discussion

4.1 Descriptive analysis

After loading the bibliographic data file and subsequent analysis, the program decreased the weighted total of the squared Euclidean distances between all pairs of nodes (topic words) in the graphical representation. Each round represented a subject term, and the topic term

dimensions denoted the frequency with which the words were observed in the bibliometric database. Links/edges were represented by lines connecting the nodes, and the thickness of the connections denoted the degree of correlation between the two concepts. VOSViewer estimated the association strength based on the ratio of the observed number of co-occurrences of two words to the predicted number of co-occurrence terms to map the links between all terms in the network. The software then used the association strength values as the inputs for the visualisation of similarities and positioned the terms as a network in a two-dimensional space so that strongly related terms were located close to each other and terms occupying central positions in the map co-occurred with more terms in the map than those occupying peripheral positions. Using an intelligent local movement algorithm, VOSViewer allocated related phrases to clusters. Thus, words shown in the same colour were comparable to those displayed in a different colour (van Eck and Waltman, 2017).

The themes' cluster affiliations, occurrences and degrees of centrality are shown in Table 5. The total link strength indicates how strongly a certain researcher is connected to all other researchers via their co-authorship. Items may also have specific weight characteristics in addition to the normal links and total link strength qualities.

Cryptocurrency and remittances are the primary subjects addressed in Cluster 1, shown in red in Figure 3. It covers several constructs that may explain the research on cryptocurrency adoption connected with remittances and financial inclusion. Several studies indicate that blockchain technology may disrupt the remittance industry owing to the inefficiencies of traditional systems in developing countries. Remittances are necessary for cash-based economies to join the formal financial system (Mhlanga, 2022; Soufaih, 2020). Digital financial inclusion shows the increasing significance of mobile money-based domestic transfers and cryptocurrency-based international remittances to several developing countries. It indicates a paradigm change in financial inclusion (van Duuren and de Pous, 2019). It prioritises digital payment rails for financial inclusion above options based on savings or credit. This new strategy focuses on an expanding recognition of the prevalent informal networks of mutual responsibility and debt in developing countries and the significance of integrating and modifying financial inclusion initiatives to accommodate them (Gupta and Kanungo, 2022).

Cluster 2 (green in Figure 3) depicts the blockchain technology related to e-commerce and supply chain management. This cluster also includes concepts such as cross-border, efficiency, international trade and supply chain management, demonstrating how blockchain may be applied in the e-commerce sector to create a decentralised online buying and selling platform. The e-commerce business is now confronted with several unique issues, such as e-commerce system security measures, openness, trust and efficiency (Kulkarni *et al.*, 2020; Qiu *et al.*, 2019). The introduction of blockchain technology in the e-commerce business may address these obstacles. The paper explored the potential applications of blockchain technology in the e-commerce sector. Blockchain applications and the potential for different facets of e-commerce, such as Payment, Security, Supply chain, Work automation using Smart contracts, and Ethical principles for e-commerce transactions' transparency, are explored (Davelis *et al.*, 2022; Hashemi Joo *et al.*, 2020).

Cluster 3 (shown in blue in Figure 3) illustrates the cryptocurrency subject associated with Bitcoin as the most well-known cryptocurrency and the distributed ledger technology coupled with big data technology. The most notable feature of distributed ledger technology, namely Ethereum (one of the keywords in the cluster), is that it enables smart contracts. The smart contract is a line of code that is recorded on a blockchain and executed when specific circumstances are met (Davelis *et al.*, 2022). In contrast to a cloud server, which uploads or saves data in a single place, the blockchain divides everything into tiny chunks and distributes them over the whole network of computers without the need for a third party. In this manner, privacy, data security and data quality are assured, and as a result, the way consumers view big data management is changing (Mafike and Mawela, 2022). Certain blockchain use cases in big data range from ensuring trustworthiness due to the lengthy

Cluster	Topic	Occurrence	Total link strength
1	Artificial intelligence	13	30
	<i>Blockchain</i>	380	1,220
	Costs	21	92
	<i>Cryptocurrency</i>	54	158
	Finance	23	106
	<i>Financial inclusion</i>	21	82
	<i>Financial inclusions</i>	20	86
	Financial service	16	78
	Financial system	15	57
	Fintech	17	56
	Internet of things	18	57
	Peer to peer networks	25	112
	<i>Remittance</i>	30	127
	<i>Remittances</i>	28	85
	Smart contract	57	277
	Smart contracts	21	81
2	<i>Blockchain technology</i>	49	158
	Commerce	22	90
	<i>Cross-border</i>	139	516
	Cross-border e-commerce	21	106
	Cross-border trades	16	65
	Cryptography	32	143
	e-commerce	24	147
	Economic and social effects	13	55
	Efficiency	18	78
	Electronic commerce	49	231
	International trade	44	183
	Network security	16	88
	<i>Supply chain management</i>	17	68
	Supply chains	42	193
3	Big data	15	69
	Bitcoin	57	189
	Cryptocurrencies	27	70
	Data sharing	15	71
	Developing countries	24	93
	Distributed ledger technology	16	107
	Distributed ledger technology	28	94
	Ethereum	14	42
	Sales	15	82
4	Block-chain	126	608
	CBDC	13	93
	Central bank	22	152
	Central bank digital currency	24	156
	Digital currency	16	105
	Distributed ledger	45	242
	Electronic money	62	299
	Peer to peer	15	97

Table 5.
Topic clusters

Source(s): Authors' elaboration

verification process to utilising a consensus algorithm that helps verify transactions to reveal valuable future outcomes to facilitate real-time, cross-border transactions regardless of the geographic location. In addition, some real-time applications are restricted to anti-money laundering, the prevention of cyberattacks, the use of blockchain in big data supply chain solutions and the protection of health information, among others (Gupta and Kanungo, 2022).

Cluster 4 shown in yellow in [Figure 3](#) focuses on the blockchain technology used to create Central Bank Digital Currency (CBDC), which enables inter-person transfers of funds. CBDC is a digital representation of domestic money with the same unit of account as domestic currency. CBDC may be implemented using Blockchain or Distributed Ledger technology (DLT) to execute and settle peer-to-peer transactions ([Kulkarni et al., 2020](#)). CBDC is a vital study field among central banks throughout the globe due to the rise of private money, such as cryptocurrencies and stablecoins, and the increased usage of digital payments to reduce the global pandemic's spread. Many central banks began their CBDC initiatives by constructing DLT proofs of concept to emulate wholesale payment systems. Then they expanded their research to include additional use cases, such as Delivery Versus Payment (DvP) and cross-border remittance. Numerous significant economies, including the United States, are investigating CBDC. China's central bank, the People's Bank of China, has already begun testing its digital retail currency ([Mafike and Mawela, 2022](#)).

4.2 Results and discussion

This research performed a literature review and meta-analysis of 48 empirical investigations to comprehend and identify optimal circumstances for Bitcoin use in the remittance industry. According to the data, 0.8% (4 out of 48) of the analysed studies contained remittances construct. Understanding the ramifications of blockchain technology on the banking sector is the focus of 1% of the examined papers. The remaining research constitutes understanding the technological adoption factors, regulatory structure and technology. The keyword cluster analysis found that the first cluster mentions blockchain about financial inclusion, a clear focus of the researcher's domain study. This first cluster is followed by a second cluster that investigates blockchain technology within the area of supply chain, highlighting the advantages that a comparable technology may provide to this market sector, including e-commerce.

Many research questions (RQs) were placed in the objective and methodology section. These questions prompted the authors to undertake the offered investigations and generate the findings. These questions will be addressed synthetically in this section.

Researchers from across the globe have characterised cryptocurrency based on its numerous technological characteristics ([RQ1](#)). For instance, cryptocurrencies are an intrinsic part of the blockchain, a public ledger in which all committed transactions are recorded as blocks ([Mendoza-Tello et al., 2019](#)). Previous research has shown a connection between blockchain and the functionality of cryptocurrencies, such as Bitcoin, used for electronic funds transmission ([Kulkarni et al., 2020](#)). Scholars have identified three generations of Bitcoin technology. Blockchain 1.0 includes applications for cryptocurrencies like Bitcoin ([Gil-Cordero et al., 2020](#); [Soufaih, 2020](#)). The technology has broader financial uses, including smart contracts and transactions involving bonds and loans, categorised as Blockchain 2.0. Beyond cryptocurrencies, blockchain may be utilised for worldwide remittances without middlemen, cross-border online payments, foreign currency transaction platforms and digital assets in the financial service sector's banking, financial markets and insurance industries ([Davelis et al., 2022](#); [Gupta and Kanungo, 2022](#)). Blockchain 3.0 is the most recent innovation with global applicability, and it may be used in administration, research, health, culture, art and literacy ([Mafike and Mawela, 2022](#)).

The remittance services business has conducted theoretical and empirical studies on cryptocurrency ([RQ2](#)). We have separated the study into conceptual and empirical categories to describe the methodology ([Castelló et al., 2021](#)). Empirical articles focused on observable or quantifiable cryptocurrency behaviours and processes in the financial services industry using a variety of qualitative and quantitative methodologies in which primary or secondary sector data was gathered or analysed. Conceptual studies, on the other hand, addressed the

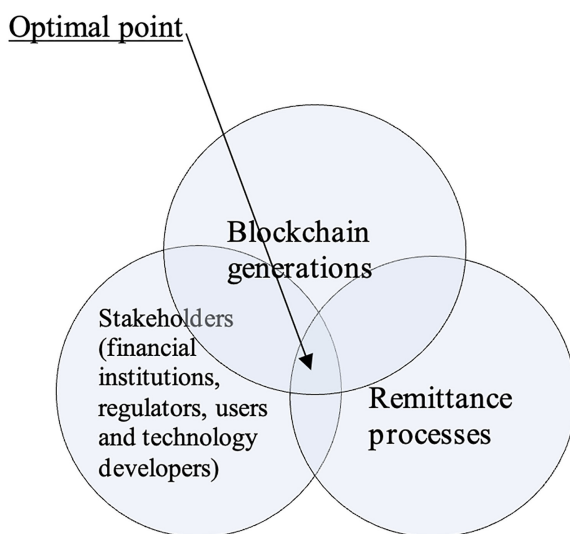
concepts, applications, theories, advantages and obstacles of cryptocurrencies in the financial services context. Of the 48 articles included in the systematic review, conceptual studies covering theoretical aspects and review-based studies accounted for 37.5% (n = 18), whereas the majority of the studies, 62.5% (n = 49) were empirical in nature and based on the collection and analysis of primary or secondary data in the context of cryptocurrencies in financial services. For instance, a critically regarded paper by [Huang \(2019\)](#) from China examined the potential and problems associated with cryptocurrencies and discovered that the more individuals perceive transactional and speculative risks, the less they expect government intervention and retention. In addition, one of the most recent studies examined the history of Blockchain and its essential components, describing Blockchain technology and Smart Contracts in more detail ([Gupta and Kanungo, 2022](#)). Exploratory study ([Davelis et al., 2022](#)) and a literature review technique were used to examine the definition, role, prospects and constraints of blockchain and how the technology may be utilised in the financial services industry ([Mafike and Mawela, 2022](#)).

This research discovered that using cryptocurrencies in the financial system may benefit all significant stakeholders in the remittance service business (RQ3). Using blockchain technology, cryptocurrencies may streamline procedures and provide secure, verifiable records of agreements and transactions ([Hashemi Joo et al., 2020](#); [Kulkarni et al., 2020](#)). The reliability and transparency of blockchain technology may enable small and medium-sized businesses to secure loans from financial institutions through self-guarantee. Through the accessibility and cheap cost of novel financial solutions, technology can reach the unbanked and underbanked masses, eliminating the obstacles to financial inclusion ([Gupta and Kanungo, 2022](#)). Moreover, cryptocurrency technology is adding value to the remittance service industry through innovative product offerings and solutions for real-time transaction and credit monitoring, the transition to branchless banking, P2P lending, the increasing use of robot-advisory services and the adoption of social trading platforms in the investment industry ([Alqaryouti et al., 2020](#); [Hashemi Joo et al., 2020](#); [Qiu et al., 2019](#); [Soufaih, 2020](#)). The development and application of smart contracts in many insurance sectors, such as peer-to-peer insurance, policy underwriting and marine and travel insurance, have greatly helped the insurance industry ([Davelis et al., 2022](#)).

4.3 Conceptual framework development

Building on the findings of this study, the study proposes a conceptual framework that captures the interplay of technological, financial and regulatory factors that influence the application of blockchain and cryptocurrency technologies in the remittance industry. The framework comprises three key elements: “Blockchain Generations”, “Stakeholders” and “Remittance Processes”. The “Blockchain Generations” refers to the evolving capabilities of blockchain technology, categorised as Blockchain 1.0, 2.0 and 3.0 ([Gil-Cordero et al., 2020](#); [Soufaih, 2020](#)). The “Stakeholders” encapsulate entities such as financial institutions, regulators, users and technology developers, whose interactions shape the remittance industry landscape ([Gupta and Kanungo, 2022](#); [Huang, 2019](#)). The “Remittance Processes” involve the operational and strategic activities related to remittance services that can be impacted by blockchain and cryptocurrencies, such as transaction execution, monitoring, compliance and financial inclusion initiatives ([Davelis et al., 2022](#); [Hashemi Joo et al., 2020](#)).

The proposed framework is shown in [Figure 6](#). It appears as three interconnected circles representing each element, demonstrating their interdependence and shared influence over the development and application of cryptocurrencies in remittance services. The centre of these overlapping circles represents the optimal point where the advantages of blockchain technology can be leveraged, stakeholder interests align and the remittance process is significantly enhanced.



Source(s): Authors' own elaboration

Figure 6. Conceptual framework that represents the optimal point to take advantage of blockchain technology, align stakeholder interests and improve the remittance process

This conceptual model is proposed as a basis for future research into understanding and optimising the use of blockchain and cryptocurrency technologies in the remittance industry. It may be especially beneficial for empirical studies that aim to measure and evaluate the impact of these technologies on different aspects of remittance services and their stakeholders.

5. Conclusion

This article examines the notion that the implementation of a blockchain-based cryptocurrency system has the potential to initiate a paradigm shift in the remittance industry. Previous financial industry solutions in the remittance sector were criticised for their higher costs and lack of efficiency. However, with time, technological advancements such as Fintech and blockchain have demonstrated their ability to cater to the diverse needs of key stakeholders. This emerging technology will likely present promising prospects and potential risks to society. Scholars and practitioners in academia and industry can derive significant advantages from the comprehensive analysis provided by this study, which examines numerous other scholarly articles and research papers exploring cryptocurrency technology's utilisation in the remittance service sector. Furthermore, given the rapid changes occurring in the financial sector and the transformative potential of cryptocurrency technology, it is crucial to examine its impact on the remittance services sector. However, more comprehensive research is needed that has systematically reviewed and consolidated the existing literature on using cryptocurrency technology in remittance services.

This study contributes to the existing scholarly literature by thoroughly examining prior research on cryptocurrencies and remittance services. There is a consensus among scholars that the financial services sector derives significant advantages from cryptocurrency's fundamental principles, namely distributed database, irreversibility of records, peer-to-peer transmission, computational logic and anonymised transparency (Mafike and Mawela, 2022). The utilisation of blockchain technology in decentralised banking, insurance, trade finance and financial markets is progressively growing, necessitating substantial academic

contributions from researchers worldwide. Since the implementation of cryptocurrency exchanges and the adoption of cryptocurrencies as a digital payment method in various prominent global economies in 2016, there has been a significant interest in this subject matter. Furthermore, it is noteworthy to observe the significant advancements made by emerging economies like India, Russia and China in enhancing the availability of financial services to the broader population.

5.1 Theoretical implications

The theoretical implications of our study extend the current understanding of cryptocurrency and blockchain technology in financial services, emphasising their transformative potential for remittance systems. By highlighting the efficiency, cost reduction and accessibility benefits, our findings contribute to the discourse on financial inclusion and technology adoption. This research bridges gaps in the existing literature by offering a comprehensive analysis through bibliometric tools, thus providing a novel perspective on the challenges and opportunities within the cryptocurrency domain. It underscores the need for regulatory frameworks and technological advancements to maximise the benefits of these innovations, suggesting a paradigm shift in how financial transactions and remittances are approached globally. Our work encourages further theoretical exploration and sets a foundation for future empirical studies in this evolving field.

5.2 Practical implications

The results of this study provide various practical implications for professionals in the industry and policymakers. The potential of blockchain technology to promote increased financial inclusion, improve transaction security, and streamline remittance services suggests that financial institutions should contemplate investing in or incorporating this technology into their operational frameworks. Furthermore, these observations provide valuable input for strategic decision-making, enabling organisations to create novel service propositions that leverage the advantages of blockchain technology.

The findings of this study could serve as a valuable resource for policymakers in formulating regulations that strike a balance between promoting the adoption of blockchain and cryptocurrencies while also addressing and minimising associated risks. This may involve the establishment of precise criteria for transactions involving cryptocurrencies and the promotion of a regulatory framework that stimulates innovation in remittance services.

Furthermore, the study highlights the significance of involving multiple stakeholders in influencing the landscape of remittances facilitated by blockchain technology. This emphasises the necessity for inclusive discussions and cooperative efforts among regulators, financial institutions, technology developers and users.

5.3 Limitations and future research

Although various limitations exist associated with the approach employed in this study, a comprehensive examination of the relevant literature has been conducted (Booth *et al.*, 2022). This study may have been affected by various factors that could have led to errors, such as sample selection bias, publication bias, challenges in data interpretation and the integration of quantitative and qualitative research within the study population.

Furthermore, the benefits of adopting cryptocurrency have yet to be subjected to empirical testing. The predominant body of research investigating the utilisation of cryptocurrencies and their underlying technology in remittance services primarily consists of empirical studies. These studies, encompassing qualitative and quantitative methodologies,

aim to analyse the process, benefits and potential challenges of adopting cryptocurrencies in remittance services. However, further empirical investigation is required to examine the impact of cryptocurrency adoption on various aspects such as financial performance, overall organisational performance, and the key stakeholders within a specific industry. Numerous stakeholders within the remittance industry need more familiarity and expertise with emerging and innovative technology.

Consequently, forthcoming studies will be able to empirically examine the impact of cryptocurrency adoption on various financial institutions, encompassing both banks and non-banks, as well as insurance and remittance service providers. The blockchain technology that underlies cryptocurrencies is currently in a phase of development and is undergoing practical experimentation in diverse commercial environments. Like other technological innovations, cryptocurrency is expected to positively and negatively impact economic activity and social life.

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